

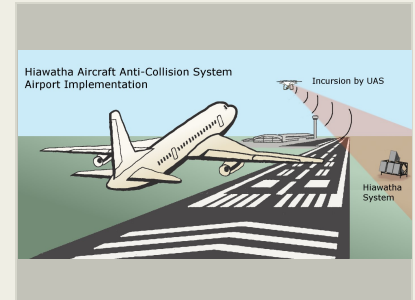
Hiawatha Aircraft Anti-Collision System, Phase II

Completed Technology Project (2017 - 2020)



Project Introduction

For Small Unmanned Aerial Vehicles (SUAVs), the FAA mandate to equip all aircraft with ADS-B Out transmitters by 1 January 2020 to support NextGen goals presents both logistical (due to SWAP constraints) and mission security issues. Aircraft without ADS-B Out capabilities, ranging from commercial or general aviation aircraft with failed transponders to adversarial aircraft deliberately operating without required transponder equipment, will continue to exist within the general airspace and pose navigational hazards and tactical threats to SUAVs. To meet these needs, Nokomis proposes to adapt its ultra-sensitive RF detection, identification, and geo-location (DIG) system, called Hiawatha to provide an unsurpassed trajectory management and anti-collision avoidance capability suitable for integration into SUAV platforms. The Hiawatha system provides flight-tested state-of-the-art ultra-sensitive RF detection, identification and geo-location performance which has been proven to detect UAVs at distances up to 15km. Nokomis will develop the Hiawatha Aircraft Anti-Collision System including software and hardware to aid in trajectory management and safe traffic flow of autonomous UAV operations capable of meeting the SWaP requirements for incorporation into a representative SUAV payload platform. The RF-based traffic management and anti-collision avoidance system will be capable of monitoring the entire spectral range from 30 MHz to 3 GHz, while providing the necessary detection, identification, and locating abilities from all angles while operating in a non-interfering manner with other potential payloads. Specifically, as part of Phase II effort, Nokomis will enhance existing geo-location capabilities and implement Trajectory Prediction and Anti-Collision/Well Clear Modules to protect aircraft and allow for efficient Traffic Flow System for maintaining aircraft spacing. The Phase II effort will build, test, and demonstrate a prototype system.



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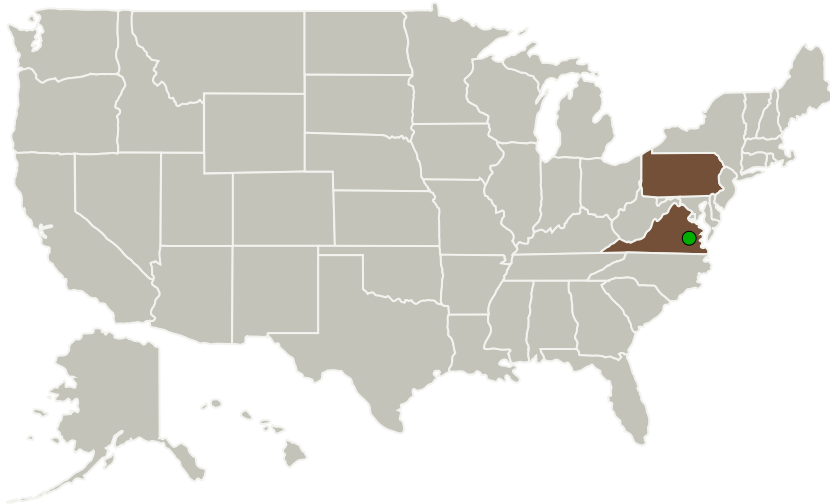
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Nokomis, Inc.	Lead Organization	Industry	Charleroi, Pennsylvania
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Pennsylvania	Virginia
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Project Transitions

April 2017: Project Start

June 2020: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/141046>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Nokomis, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

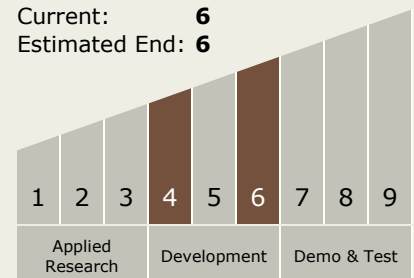
Carlos Torrez

Principal Investigator:

Karen H Canne

Technology Maturity (TRL)

Start: **4**
 Current: **6**
 Estimated End: **6**

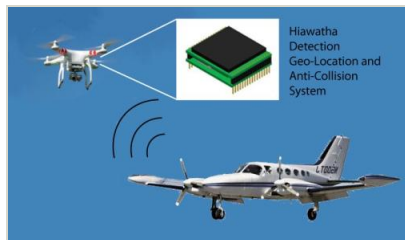


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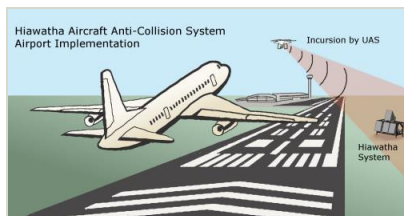
Images



Briefing Chart Image

Hiawatha Aircraft Anti-Collision System, Phase II Briefing Chart Image

(<https://techport.nasa.gov/image/131087>)



Final Summary Chart Image

Hiawatha Aircraft Anti-Collision System, Phase II

(<https://techport.nasa.gov/image/135570>)

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.2 Avionics Systems and Subsystems
 - └ TX02.2.2 Aircraft Avionics Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System